F1-217

Executive Summary

Project Title and Applicant: Sacramento County Urban Runoff OP Pesticide Toxicity Control Program, Sacramento Area Stormwater Permittees.

Project Description and Primary Biological/Ecological Objectives: This project consists of a multi-phase program to identify, evaluate, and eliminate the toxicity of urban runoff caused by elevated levels of diazinon and chlorpyrifos. This project includes a Water Quality Monitoring Program, a Source Identification Program, an Effects Evaluation Program and an Education and Outreach Control Program. Water quality impairment is the primary stressor, in-stream aquatic habitat is the priority habitat, and salmonids, splittail, and stripped bass are the priority species for this project. The ecological objective is to eliminate the potential risk to the priority species and other aquatic life within critical habitats.

Approach/Tasks/Schedule: This project uses the significant amount of information generated by the Permittees, as well as information generated by the Urban Pesticide Committee (UPC). The UPC has drafted an Education and Outreach Strategy Report (EOS) that includes a comprehensive menu of outreach messages and strategies that should be considered in developing a community-wide Pesticide Toxicity Control Program. One facet of this project is the development and implementation of a Sacramento County-wide Education and Outreach Program per the recommendations in the UPC's EOS Report, that reflect Sacramento area OP pesticide use data and target audience demographics. Another facet of this proposal is to generate data (and conduct studies) to fully characterize the environmental significance of these OP pesticides in urban runoff and receiving waters. The project includes:

I. Water quality monitoring tasks to characterize levels of diazinon and chlorpyrifos within urban runoff and creeks, the Sacramento and American Rivers, and rainfall. This task will commence upon grant award and continue for 12 months. Subsequent years monitoring is anticipated depending upon the data collected in the first year and the data needs of the watershed model and risk assessment.

II. OP insecticide user characterization tasks to determine priority users and to design effective education and outreach control programs. This task will also commence upon grant award and be completed within three months.

III. Annual OP characterization reports, an urban-shed environmental fate and transport (F&T) model for Arcade Creek, and a probabilistic ecological risk assessment. Detailed Scopes of Work for the F&T model and risk assessment will commence upon grant award. The studies will not begin until at least the second year when (and if) sufficient information is developed.

IV. Education and outreach program development and implementation tasks. Development will commence upon completion of tasks in II above and be completed within four months. The first year program's implementation is scheduled to commence in the spring of 1998.

Justification for Project and Funding by CALFED: This project qualifies for funding under CALFED because it significantly contributes to two of the four stated objectives of the long-term comprehensive plan for the Bay-Delta system: to provide good water quality for all beneficial uses, and to improve and increase aquatic and terrestrial habitats and improve ecological functions to support sustainable populations of diverse and valuable plant and animal species.

Budget:

ESTIMATED COSTS	YEAR 1	YEAR 2	YEAR 3
TOTAL	$856,500	$407,000	$577,000
IN-KIND CONTRIBUTION	$193,000	$103,246	$124,123
GRANT REQUEST	$663,500	$303,754	$452,877

Applicant Qualifications: The Sacramento Area Stormwater Permittees are extremely qualified to conduct this project. They have an impressive seven-year track record of developing and implementing cost-effective monitoring programs, special studies, and stormwater BMPs, including education and outreach programs. Also, the City of Sacramento's stormwater program was nominated for consideration of receipt of a 1997 National Storm Water Control Program Excellence Award.

Monitoring and Data Evaluation: Water quality monitoring and insecticide user characterization data will be evaluated in annual comprehensive characterization reports, a watershed modeling report, a probabilistic risk assessment report, an education and outreach report, and annual effectiveness evaluation reports. These reports will provide a means to design and implement each phase of the project based upon a careful and comprehensive evaluation of pre-requisite data, as well as a means to evaluate the effectiveness of the implemented control programs.

Local Support/Coordination/Compatibility with CALFED objectives: This project has been discussed and coordinated with various groups who have given positive indication of support including the UPC, Region Boards (2 and 5), the DPR, the Statewide Stormwater Task Force, the Central Valley Stormwater Committee, the Sacramento River Watershed Program, and the Sacramento Regional Sanitation District. This proposal does not foreclose any habitat restoration options, and it does not conflict with any of the CALFED Bay-Delta Program objectives or alternatives.

TITLE PAGE

Title of Project: Sacramento County Urban Runoff OP Pesticide Toxicity Control Program

Applicant: Sacramento Area Stormwater Permittees: City of Sacramento, County of Sacramento, City of Folsom, City of Galt

Lead Agency: City of Sacramento, Department of Utilities

Principal Investigator: Larry Nash, Senior Engineer, Engineering Services Division, Department of Utilities

Address: Engineering Services Division, Department of Utilities, City of Sacramento, 5770 Freeport Blvd, Suite 100, Sacramento, CA 95822

Phone: (916) 433-4015

Fax: (916) 433-6652

Type of Organization and Tax Status: Incorporated city - exempt tax status.

Tax ID Number and/or Contractor License: Not applicable.

Technical and Financial Contact: Same as above.

Participants/Collaborators in Implementation:

County of Sacramento
City of Galt
City of Folsom
Consultants: Candidates include Larry Walker and Associates, Archibald and Wallberg, John Tomko, Aqua Science, and other special consultants for education and outreach activities and risk assessment/watershed modeling.

RFP Project Group Type: Other Services

PROJECT DESCRIPTION

Project Description and Approach: This project consists of a multi-phase program to identify, evaluate, and control the toxicity of urban runoff caused by elevated levels of diazinon and chlorpyrifos. This program includes (1) a Water Quality Monitoring Program to characterize the levels of these insecticides; (2) a Source Identification Program; (3) an Effects Evaluation Program to estimate beneficial use impacts; and (4) an Education and Outreach Control Program.

Location and Geographic Boundaries of Project: The boundaries of the County of Sacramento, which is located within the Sacramento Valley Watershed.

Expected Benefits: Water quality impairment due to OP pesticide toxicity is the primary stressor and the "In-stream Aquatic Habitat" is the priority habitat for this project. Measured diazinon and chlorpyrifos levels, including toxicity TIE results, indicate that aquatic life (i.e., crustaceans) within this priority habitat are potentially at risk. Salmonids, splittail, and stripped bass are the priority species that are the focus of this project. These species spawn and rear within the aquatic in-stream habitat. These species are potentially at risk due to the depletion of their food source (crustaceans) during their younger life stages. Organisms similar to Ceriodaphnia dubia are food sources for fish within these habitats. Therefore, toxic effects on these organisms may weaken the food web and subsequently cause a reduction in fish populations.

The objective of this project is to eliminate the toxicity of urban runoff due to the presence of diazinon and chlorpyrifos, thereby eliminating the potential risk to the priority species. Since the proposed control program is a relatively untried education and outreach program, the likelihood of success is unknown. The effectiveness of this program will be evaluated on an annual basis via monitoring and surveys. In addition, a probabilistic ecosystem risk assessment will be conducted to quantify the risk to the priority species and native aquatic life.

Third parties who will benefit from this project include stormwater management agencies throughout the State of California. This project will establish the feasibility of (and costs) of controlling urban sources of diazinon and chlorpyrifos through an education and outreach program. Locally, the Sacramento Regional County Sanitation District, whose discharge also contains OP pesticides, will also benefit since the control program will be holistic and include messages to reduce the discharge of OP pesticides to sanitary sewer systems. This proposal does not foreclose any habitat restoration options, and it does not conflict with any of the CALFED Bay-Delta Program objectives or alternatives.

Background and Biological/Technical Justification: Since 1992, the USGS, the Central Valley Regional Water Quality Control Board (Region 5), and the Sacramento

Stormwater Permittees, have measured diazinon and chlorpyrifos in either urban runoff, urban creeks, and/or the Sacramento River at levels in excess of the California Department's of Fish and Game (1994) aquatic life criteria. In addition, toxicity TIE studies have implicated diazinon and chlorpyrifos as urban runoff toxicants.

The Bay Area/Central Valley Urban Pesticide Toxicity Control Committee (UPC) was created to address pesticide toxicity in stormwater and POTW effluent. The UPC has developed a multi-faceted strategy to eliminate pesticide toxicity in stormwater runoff and POTW effluent. Participants include Regional Boards 2 and 5, the City and County of Sacramento, stormwater agencies and POTWs within the San Francisco Bay area, DPR, USEPA, pesticide manufacturers/formulators, public interest groups, and consultants.

The UPC has concluded that the ecological threat potential of diazinon and chlorpyrifos levels within stormwater and POTW effluents is sufficient to warrant the development and implementation of a preventive-based education and outreach program. Hence, the UPC has drafted a pesticide education and outreach strategy. This proposal, in part, uses the recommendations in this education and outreach strategy to develop a pesticide toxicity control program for the Sacramento area.

Because of the technical and regulatory expertise and stakeholder composition of the UPC, the UPC will be used as an Advisory Committee to guide the development, implementation, and evaluation of the Permittees' OP Pesticide Toxicity Control Program. Tom Mumley and Val Conner of the San Francisco Bay and Sacramento Valley Regional Water Quality Control Boards, co-chairs of the UPC, have both endorsed this project.

Proposed Scope of Work:

Task 1: Water Quality Monitoring: Determine levels of diazinon and chlorpyrifos (including temporal and spatial trends) within urban runoff, urban creeks, the Sacramento and American Rivers and rainfall. The objectives of this monitoring are threefold: (1) to provide a comprehensive characterization of diazinon and chlorpyrifos levels for input into the Arcade Creek watershed model and the probabilistic ecological risk assessment (see Task 3 below); (2) to determine the baseline characterization of diazinon and chlorpyrifos i.e., levels prior to implementation of the education and outreach program (see Task 4 below); and (3) to identify and quantify any significant sources of these insecticides.

Subtasks include the following:

I. Development of a Sampling/Experimental Plan including a QA/QC plan. Diazinon and chlorpyrifos samples will be analyzed by ELISA analysis performed by City chemists at the Fairbaim Water Treatment Plant's laboratory with 10% of

the samples analyzed by GS/MS for QA/QC.

II. River sampling through the ongoing Comprehensive Monitoring Program (CMP). The CMP is an ambient river monitoring program involving the City and County of Sacramento. Grab samples will be collected at the five CMP sites (three on the Sacramento River and two on the American River) on a monthly basis. This sampling will also be done for the episodic rainfall events being monitoring by the CMP for the Permittees' stormwater program.

III. Three stormwater runoff sites (Strong Ranch Slough, Sump-104 and Sump-111) will be sampled during five stormwater runoff events under the Permittees' stormwater monitoring program. Existing flow-composited samplers will be used.

IV. Five urban runoff sites (Strong Ranch Slough, Sump-104, Sump-111 and two other sites with varying land use, demographics, and size) will be sampled on the same day of the monthly CMP sampling events. Two additional flow-composited samplers with flow meters will be purchased.

V. Rainwater will be collected during the five storm events monitored in III above at three locations. Three rainfall samplers with rain gauges will be purchased.

VI. The Arcade Creek watershed will be sampled at five locations using flow-composited samplers during the five storm events monitored in II above, and during the monthly monitoring (IV above). Five additional flow composite samplers with flow meters will be purchased.

VII. Ten high insecticide-use sites will be sampled (e.g., animal pounds, pet groomers, vets, golf courses, PCOs). Samples will be grab or flow composited depending upon circumstances.

VIII. Six (6) Whole Effluent Toxicity (WET) tests will be run on samples collected during three storm events at an Arcade Creek sampling site. Two WET tests will be run in parallel for each event. The first test's daily renewal water will be the water collected during the storm event. The second test's daily renewal water will use water collected each subsequent day after the storm event. ELISA tests for diazinon and chlorpyrifos will be done on each daily sample.

IX. A flow-through bioassay on Ceriodaphnia dubia will be conducted at the Arcade Creek site during each of the three storm events sampled in VII above. AQUA Science has developed a flow-through sampling procedure using a mobile bioassay facility and will be subcontracted to provide this service.

Task 2: Identify and Quantify Urban Insecticide Users: Urban users of diazinon and chlorpyrifos include residents, licensed pesticide control operators, employees or

owners of commercial facilities, and public agency employees. This task includes surveys of these users (and the review of DPR pesticide use data) to determine their insecticide use patterns (i.e., types, quantities, application and disposal methods, etc.). These surveys will be used to identify which users pose the greatest risk to water quality (see Task 3) thereby establishing which users are addressed first. These surveys will also be used to design an effective education and outreach control program. Finally, these surveys will quantify baseline insecticide use behaviors/patterns that can be rechecked following implementation of the control programs so as to determine the program's effectiveness.

Subtasks include the following:

I. Review and evaluate the following existing survey data:

   A. The residential telephone survey.
   B. The retail store survey on pesticides sales.
   C. The survey of PCOs.
   D. The DPR reported PCO OP insecticide use data.
   E. Other UPC member's pesticide use survey reports.

II. Design and conduct a survey of commercial users.

III. Design and conduct a survey of public agency users.

Task 3: Evaluation of Effects:
This task includes the evaluation and reporting of the data collected in Task 1 and all validated historical data. Subtasks include:

I. A report including summary tables and graphs providing a comprehensive characterization of diazinon and chlorpyrifos levels and toxicity data within Sacramento area urban runoff and receiving waters. This report will also (1) provide the baseline characterization of diazinon and chlorpyrifos (i.e., conditions prior to the implementation of the control program); (2) evaluate how this baseline data, and data collected following implementation of the control program, can best be used to statistically assess the effectiveness of the control program; (3) identify and quantify any significant sources; and (4) estimate water quality impacts to main stem rivers (Sacramento and American) based on the dilution capacity of these rivers and annual dry and wet weather loading rates from the Sacramento urban sheds.

II. A watershed model will be developed for the Arcade Creek watershed using the ArcView GIS and EPA's BASINS model, or similar GIS-structured watershed model. This model will include an environmental fate and transport component. Special studies may required to determine insecticide degradation and soil

retention and runoff rates based upon different sources and application rates. A separate modeling report will be prepared. Year 1 activities include only the preparation of a detailed Scope of Work for this task.

III. An ecological probabilistic risk assessment will be conducted using the exposure data described in A and B above, currently available laboratory toxicity data for various species, and receptor data (life histories and seasonal feeding requirements) of the fish and invertebrates found in the receiving waters, including the priority species discussed above. Year 1 activities include only the preparation of a detailed Scope of Work for this task.

Task 4: Education and Outreach Control Program: A pesticide user education and outreach program will be developed and implemented. This program will be a pilot test of the UPC's Education and Outreach Strategy. A public education consultant will be hired to develop a cost-effective program for each urban insecticide user groups. The program will focus on eliminating the toxicity of urban runoff due to diazinon and chlorpyrifos. However, it will also include messages to reduce the use of these insecticide indoors so as to minimize their discharge to sanitary sewer drains and potential toxicity impacts at the POTW. The program will stress Integrated Pest Management techniques, and proper pesticide use, equipment cleaning, and disposal procedures.

Subtasks include:

I. Development of cost-effective education and outreach programs for the four user groups using the information developed in Task 2. The objective is to design programs that collectively will reduce diazinon and chlorpyrifos levels in urban runoff to non-toxic levels. This will include the following:

   A. The development of insecticide pathway diagrams.

   B. The prioritization of insecticide user groups based upon the relative insecticide contribution of each user group to the toxicity of urban runoff.

   C. The identification and description of target audiences.

   D. The identification and development of effective outreach messages.

   E. The identification and development of effective outreach strategies.

   F. The identification and development of effectiveness evaluation methods.

II. A report describing, in detail, each user group's education and outreach program, and including (1) recommendations on phased implementation based

upon the prioritization of user groups, (2) cost estimates to implement each phase, (3) time schedule to implement phases, and (4) recommended effectiveness evaluation techniques for each phase.

III. The implementation of each user group's education and outreach program.

IV. The implementation of each user group's effectiveness evaluation program.

Monitoring and Data Evaluation: Water quality monitoring data (see Task 1) and its evaluation/interpretation will be provided in annual comprehensive characterization reports, in a watershed modeling report, and in a probabilistic risk assessment report (see Task 3). Insecticide user identification surveys (see Task 2) will be conducted. This data's evaluations and interpretations will be discussed in an education and outreach report (Task 4.II). This data will be the basis for the recommended education and outreach programs likewise described, in detail, in the Task 4.II report.

The success of the education and outreach control program will be assessed based upon the reduction in pesticide levels within urban runoff using, if practical, a statistical regression procedure developed by the Permittees for trace metals. This information will be provided in the annual comprehensive characterization reports. In addition, for residential users, yearly telephone surveys will be conducted to determine if positive behavioral changes on pesticide use has occurred as a result of the education program. Similar follow-up surveys for the other three user groups will likely be recommended in Task 4,I,F above. This information will be provided in annual Effectiveness Evaluation Reports.

Implementability: There are no obstacles to implementing the project. All applicable laws and regulations will be complied with. No permits nor easements are required.

The UPC will function as an Advisory Committee for this project. Furthermore, this project will not duplicate the education and outreach projects being developed by Central Contra Costa Sanitary District in their grant proposal. If both proposals receive funding, the UPC advisory committee will be the vehicle to ensure that these two projects are coordinated.

This project will be coordinated with the Permittee's NPDES monitoring program, the CMP monitoring program, the Sacramento River Watershed monitoring program, and the USGS NAWQA monitoring program. The project is consistent with the Permittee's Constituents-of-Concern Control Strategy Program. This project has been discussed and coordinated with various groups who have given positive indication of support. These include the UPC, Region Boards (2 and 5), the DPR, the Statewide Stormwater Task Force, the Central Valley Stormwater Committee, the Sacramento River Watershed Program, and the Sacramento Regional Sanitation District.

COSTS AND SCHEDULE

Budget: The proposed project covers a three year period. Costs are as follows:

ESTIMATED COSTS	YEAR 1	YEAR 2	YEAR 3
TOTAL	$856,500	$407,000	$577,000
IN-KIND (%)	$193,000 (22.5)	$103,246 (21.5)	$124,123 (25.4)
GRANT REQUEST	$663,500	$303,754	$452,877

A table showing a detailed cost estimate broken down by Task is attached. Cost estimates projected for Years 2 and 3 are rough estimates only, since they are in large part determined by the data collected and knowledge gained during Year 1. Likewise the cost estimate for implementation of Year 1's education and outreach program is also a rough estimate that will be refined in the Education and Outreach Report (Task 4.II).

Service contracts will be awarded based upon the City of Sacramento's established professional services' procurement and award process which complies with all applicable federal, state, and local laws and regulations. Grant payment requests will be submitted monthly. Requests for payment will clearly document the task being billed including its funding/completion percentages. Any significant deviations from the estimated budget will be noted and explained, including measures being taken to get tasks back on budget. Monthly grant payment requests will also document the in-kind services/costs incurred by the Stormwater Permittees. All grant payment requests will be reviewed and approved by the project's lead investigator, Mr. Larry Nash, prior to their submittal to CALFED.

Schedule Milestones: The proposed project covers a three year period, beginning with award of the grant. Proposed tasks and schedule milestones (months after grant award) are as follows:

I. Water quality monitoring tasks will commence upon grant award and continue for 12 months. Subsequent years monitoring is anticipated depending upon the data collected during Year 1 and needs identified in the detailed SOWs for the fate and transport model and risk assessment studies. An estimate for the second and third year monitoring is included in this proposal, but will be updated once the first year's data is assessed.

   A. Sampling and Experimental Plan - (1 mth)
   B. Quarterly Progress Reports - (every three months)

II. OP insecticide user identification and characterization tasks will commence upon

grant award. They will be used to identify which users pose the greatest risk to water quality, and to design effective education and outreach control programs.

A. Pesticide User Surveys - (3 mths)

III. Effects evaluation tasks include a comprehensive OP characterization report, an urban-shed environmental fate and transport model for Arcade Creek, and a probabilistic ecological risk assessment. Detailed Scopes of Work (SOWs), with more accurate cost estimates, for the fate and transport model and risk assessment studies will commence upon grant award. The actual studies will not begin until at least Year 2 when (and if) sufficient information/data is available to initiate these studies. Cost estimates to conduct these studies in Years 2 and 3 are included in this proposal, but will be updated upon completion of their detailed SOWs.

A. Annual Comprehensive Characterization Report (every 15 mths)
B. Watershed Model and Risk Assessment SOWs (6 mths)
C. Watershed Model and Risk Assessment Reports (18 to 36 mths, depending on B above)

IV. Education and outreach program development will commence upon grant award. Year 1 program implementation is scheduled to commence in the spring of 1998. Cost estimates for Year 2 and 3 program implementations are included in this proposal, but will be updated once the first year's program is implemented and assessed.

A. Education and Outreach Report (6 mths)
B. Year 1 Effectiveness Evaluation Report (18 to 21 mths, depending on recommendations in A above)
C. Year 2 and 3 Effectiveness Evaluation Reports (based upon recommendations in A above)

APPLICANT QUALIFICATIONS

Staff Organization and Collaborating Participants: An organizational chart is attached. Mr. Larry Nash is the lead investigator who will receive guidance from two advisory committees. Mr. Nash has under him three task managers. The three task managers will call upon a team of consultants and other city and county staff to assist them in the implementation of this project.

Biosketches:

Larry Nash, Registered Civil Engineer: Mr. Nash is a professional civil engineer. Since March 1997, he has worked for the City of Sacramento Department of Utilities as a Senior Engineer in charge of the Water Quality Division and the City's Stormwater Management Program. His work experience includes 21 years performing regulatory and compliance activities at the Central Valley Regional Water Quality Control Board, with 15 years experience supervising professional staff as a Senior Engineer in charge of regulatory units. He has extensive knowledge and experience in NPDES permitting and monitoring requirements, water quality objectives, and beneficial use assessments.

Elissa Callman, Registered Civil Engineer: Ms. Callman, an Associate Civil Engineer with the City of Sacramento, has 10 years of experience in design of public works facilities, stormwater management, and water quality. She is an experienced Project Manager of multi-agency projects including the Sacramento NPDES Stormwater Monitoring Program from 1990 to present; the Sacramento NPDES Stormwater Monitoring Program Toxicity and TIE Study on stormwater and urban creeks; and the Lower American River Urban Runoff Study (EPA 205 (j) grant study).

Kathy Russick, Registered Civil Engineer: Ms. Russick is an Associate Civil Engineer with the County of Sacramento's Stormwater Quality Section. She is a California registered civil engineer with 10 years of experience in water resources planning, watershed management, and water quality studies. Ms. Russick spent seven years with the Santa Clara Valley Water District (SCVWD) where she developed and managed SCVWD's reservoir watershed management program, including a GIS-based watershed model. Ms. Russick subsequently spent over two years with a Sacramento area consulting firm where she managed a number of watershed sanitary survey and stormwater projects.

Rita Pasillas, Public Information Specialist: Ms. Pasillas, a Certified Marketing Director, has over 15 years experience in advertising, public relations and development of community outreach programs including development and implementation of marketing and advertising campaigns for several Sacramento developers; conceptual development and implementation of the first Public Works Employee Orientation Program; providing community outreach support for the Neighborhood Traffic

Management Program, a residential traffic calming program, and the Captain Jerry Traffic Safety Program, a children's traffic safety education program; and assistance with the distribution and tracking of $400,000 in grant funds for the Sacramento Metropolitan Arts Commission.

John J. Tomko, Registered Civil Engineer: Mr. Tomko has worked in the environmental field for 22 years. His work experience includes eight years with the California Water Resources Control Board and 10 years as an independent consultant. Mr. Tomko's work experience includes project manager on the City of Sacramento's combined sewage system's 5-year water quality monitoring program and a risk assessment study; project manager on the Sacramento Areas' Ambient Monitoring Program; and (3) assistance in the development of the Sacramento's Comprehensive Stormwater Management Program.

Jeanne Wallberg, Archibald and Wallberg Consultants: Ms. Wallberg, a principal partner with Archibald and Wallberg Consultants, has 10 years of experience in stormwater surface water, environmental impact, and groundwater studies. Ms. Wallberg has long-term stormwater experience with two Central Valley municipal stormwater programs providing assistance with development of stormwater monitoring programs and pollution control programs. Specific work experience that directly pertains to this project includes (1) coordinator of source identification studies for lead and copper for the Sacramento NPDES Stormwater Program, including developing pathway diagrams, conducting literature reviews, identifying sources, and developing strategies for incorporation of information into stormwater pollution control programs and (2) development of a work plan to characterize pesticide usage in the City of Modesto including evaluation of existing data and conducting surveys to determine pesticide use trends.

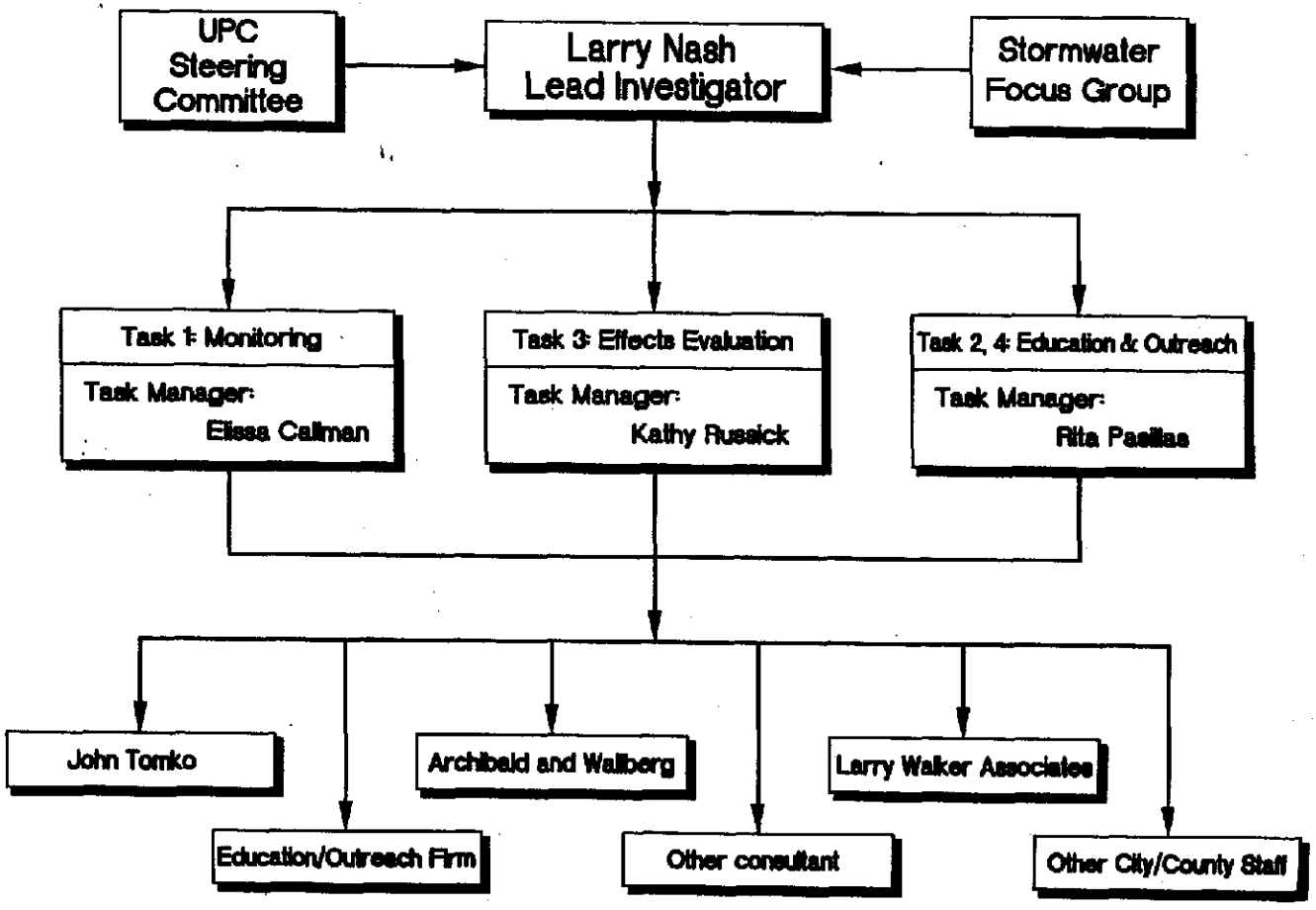
Armand Ruby III, Larry Walker Associates: Mr. Ruby is a senior environmental scientist and experienced project manager, specializing in water quality assessment, monitoring programs, and regulatory compliance issues. During his 38 years of professional experience, he has contributed professional leadership and technical expertise to numerous water quality projects including the stormwater monitoring programs for the Sacramento Permittees, the Fresno-Clovis metropolitan area, the Cities of Davis, Bakersfield, Oxnard, Stockton, Ventura County, and Orange County. The Larry Walker Associates team has wide ranging experience in all aspects of stormwater and receiving water monitoring, and development of stormwater management, pollution prevention and source control programs. Noteworthy projects include (1) development of a statistical approach to evaluate long-term effectiveness of reductions of pollutants in Sacramento stormwater discharges, (2) the Sacramento Coordinated Monitoring Program, (3) the Sacramento River Watershed Program, and (4) the Calluegas Creek Watershed Program in Ventura County.

COMPLIANCE WITH STANDARD TERMS AND CONDITIONS

The terms and conditions for contracts awarded under this program are agreeable and can be complied with by the City of Sacramento, Department of Utilities. These terms and conditions will also be applied to all subcontracts issued with these grant funds.

OP PESTICIDE CONTROL PROGRAM

Organizational Chart



COST ESTIMATE
OP PESTICIDE CONTROL PROGRAM

TASK	In-Kind Costs																
	Prof. Staff 70	Tech Staff 30	Lab Staff 60	Consult. Staff 100	ELISA $/test 30	Service Contracts	Samplers	Year 1 Total Cost	Year 1 In-Kind	Year 1 Grant Cost	Year 2 Total Cost	Year 2 In-Kind	Year 2 Grant Cost	Year 3 Total Cost	Year 3 In-Kind	Year 3 Grant Cost
Task I: Water Quality Monitoring																
Task I: Sampling Plan Development	1,400					4,000		5,400	1,400	4,000						
Task II: Monthly River Sampling	1,400		3,600	6,000	3,600	2,000		16,600	14,600	2,000						
Task III: Storm Runoff Sampling	1,400		800	6,000	800	2,000		11,200	9,200	2,000						
Task IV: Monthly Runoff Sampling	5,600	12,000	3,600		3,600	6,000	20,000	50,800	24,800	26,000						
Task V: Rainfall Sampling	1,400	1,200	800		800	2,000	3,000	9,400	4,400	5,000						
Task VI: Arcade Creek Sampling	5,600	12,000	5,100		5,100	6,000	50,000	83,900	27,800	56,000						
Task VII: High-Use Site Sampling	2,800	6,000	3,000		2,400	4,000		18,200	14,200	4,000						
Task VIII: WET Tests	2,800					20,000		22,800	2,800	20,000						
Task IX: Flow Through Bioassay	2,800					15,000		17,800	2,800	15,000						
Subtotal Costs	$25,200	$31,200	$17,100	$12,000	$16,500	$61,000	$73,000	236,000	102,000	134,000	160,000	69,153	90,847	160,000	69,153	90,847
Task 2: ID Urban Insecticide Users																
Task I: Evaluate Existing Surveys	2,800					20,000		22,800	2,800	20,000						
Task II: Commercial Survey	2,800					21,500		24,300	2,800	21,500						
Task III: Public Agency Survey	2,800					21,500		24,300	2,800	21,500						
Subtotal Costs	$8,400					63,000		71,400	8,400	63,000						
Task 3: Evaluation of Effects																
Task I: Characterization Report	4,200					50,000		54,200	4,200	50,000	40,000	3,100	36,900	40,000	3,100	36,900
Task II: Watershed Model and Report	2,800					10,000		12,800	2,800	10,000	75,000	7,000	68,000	15,000	3,281	11,719
Task III: Risk Assessment and Report	2,800					10,000		12,800	2,800	10,000	125,000	7,000	118,000	15,000	3,281	11,719
Subtotal Costs	$9,800					70,000		79,800	9,800	70,000	240,000	29,474	210,526	70,000	8,588	61,404
Task 4: Education/Outreach Program																
Task I.A: Pathway Diagrams						3,500		3,500	0	3,500						
Task I.B: Prioritization of Users						3,000		3,000	0	3,000						
Task I.C: ID Target Audiences						2,000		2,000	0	2,000						
Task I.D: Develop Messages						5,000		5,000	0	5,000						
Task I.E: Develop Strategies						5,000		5,000	0	5,000						
Task I.F: Develop Evaluation Methods						2,000		2,000	0	2,000						
Task II: Prepare Report	14,000					10,000		24,000	14,000	10,000						
Task III.A: Implement Residential Program	14,000					220,000		234,000	14,000	220,000	100,000	5,983	94,017	100,000	5,983	94,017
Task III.B: Implement PCO Program	11,200					25,000		36,200	11,200	25,000	10,000	3,094	6,906	10,000	3,094	6,906
Task III.C: Implement Commercial Program	11,200					29,000		40,200	11,200	29,000	12,000	3,343	8,657	12,000	3,343	8,657
Task III.D: Implement Public Agency Program	11,200					7,000		18,200	11,200	7,000	5,000	3,077	1,923	5,000	3,077	1,923
Task IV: Implement Effectiveness Evaluations	11,200					85,000		96,200	11,200	85,000	50,000	10,000	40,000	50,000	10,000	40,000
Subtotal Costs	72,800					396,500		469,300	72,800	396,500	177,000	25,497	151,503	177,000	25,497	151,503
TOTAL	$116,200	$31,200	$17,100	$12,000	$16,500	$590,500	$73,000	856,500	193,000	663,500	577,000	124,123	452,877	407,000	103,248	303,752